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REPORT ON FISHERY ISSUES REGARDING CENTRAL DELTA INTAKES

A group of biologists and engineers met March 9, 2000 to identify how two proposed new diversion locations in the cental delta might be expected to affect fish resources. This report summarizes the results of that meeting.

PARTICIPANTS

Many members of this group were members of the Diversion Effects on Fish Team (DEFT) that in 1998 prepared two reports on issues relating to other Calfed proposals. Participants in this meeting were:
John Andrew (DWR), David Briggs (CCWD), Pete Chadwick (CALFED), Dave Forkel (Delta Wetlands), Paul Forsberg (DFG) Robert Gonzales (EBMUD), Darryl Hayes (CALFED), Bruce Herbold (EPA), William R.Johnston (MID, SJRG), Tina Swanson (The Bay Institute), Mike Thabault (FWS), Matt Vandenberg (FWS), Frank Wernette (DFG), Jim White (DFG).

PROPOSALS

Three possible configurations of diversion intakes in the central delta were described.

Option A: Multiple intakes (with a total diversion capacity of 4000 cfs) around the periphery of MacDonald Island could be used to deliver water to southern delta agriculture, as well as to the State/Federal export facilities. Maximum diversion rate by southern Delta irrigators is approximately 1500 cfs at the height of the summer growing season, leaving at least 2500 cfs available at that time to replace Federal either substitute for or add to export diversions from south delta channels. Such a diversion might reduce the impact of federal exports on stage in south delta channels by approximately .1 ft for each 1000 cfs of reduction in federal diversions from the south delta. If all delta diversions could be supplied from MacDonald Island water levels in the channels would be moot. Water could be conveyed south from MacDonald Island via a combination of existing channels (Trapper and Whiskey sloughs, Victoria Canal), ,siphons and overland conveyance. Delivery to delta agriculture would require some sort of overland distribution network. The present South Delta work plan includes consideration of a consolidated point of diversion that would deliver water to delta agriculture from Clifton Court Forebay.

Option B: Several intakes (total capacity 4000 cfs) around the periphery of Bacon Island could be used either to fill storage space on the island (120 TAF) or as a site of direct diversion for the State and Federal export facilities. This option includes a direct overland connection to Clifton Court Forebay. Diversion and storage of water on this island were simulated in the Environmental Water Account gaming and were useful in reducing entrainment impacts of the projects and providing increased water supply reliability.

Option AB: Since the structure and function of options A and B are not mutually exclusive, the third option simply consists of a combination.

These options were presented as possible tools CalFed might more fully evaluate in Stage I. Because each option would have several components and serve several functions, there are a

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variety of ways of phasing in these options, particularly in regard to their interactions with other parts of the CALFED program. The options would need to be integrated with the South Delta Program, the Integrated Storage Investigations, the proposed Hood Diversion, several components of the Ecosystem Restoration Plan, and other parts of the CalFed program. None of these options were presented as final designs or as exclusive alternatives to other elements of the CalFed program.

ASSUMPTIONS

In all cases, diversions were assumed to be possible through screens that did not require associated fish salvage and handling operations. The Fish Facilities Team has been asked to review the feasibility of such an operation. Information was presented by Contra Costa Water District on the effectiveness of their new on-river diversion on Old River. Sampling by DFG found few delta smelt in front of the CCDW screens, even when high smelt densities in the state and federal salvage facilities nearby led to substantial export reductions to reduce delta smelt entrainment.

The group assumed that the screening of delta agricultural diversions called for in the Ecosystem Restoration Plan would be in place. Therefore, the evaluation of this proposal focused not on the benefits of screens but on the effects of a consolidated diversion point for delta agriculture, listed fish species and water supply compared to the large number of existing diversions.

It was assumed that these facilities would be operated to reduce overall export impacts. In fact, such operations might require considerable more knowledge of fish distribution and vulnerability to diversion impacts than is currently available.

POTENTIAL EFFECTS

Both potentially beneficial and detrimental effects on fish of cental delta diversions were identified. Many of the proposed effects would be very sensitive to the size of the diversion. Most of the hypothesized impacts could be either, positive and negative depending on how the diversions were operated.

Hypotheses of Benefit:

1. Effective screening without the need for salvage and handling would eliminate post-screening mortality at the existing facilities.
2. Greater tidal action in the central delta would carry fish away from the screens more effectively than occurs in the south delta. At larger diversion sizes this effect would be reduced.
3. Diverting water from a larger central Delta channel could have proportionately smaller impacts on some of the fish in the channel, depending on what part of the channel the fish are using. At larger diversion sizes this effect would be reduced.
4. The flexibility to choose among several diversion locations could reduce export impacts by diverting water from site where fish density is lower. At larger diversion sizes and higher total diversion rates this effect would be reduced.
5. Storage, as included in options B and AB, would permit stored water which was diverted when fish were not at risk to replace some diversions from Delta channels at times when fish densities are high in the delta. At smaller storage sizes this effect would be reduced.
6. Providing alternative supplies to southern delta agriculture would obviate the need for tidal

barriers and avoid potential barrier-related fish impacts.
7. A consolidated screened diversion for delta agricultural supplies could reduce fish impacts compared to the many existing southern Delta agricultural diversions, even assuming they are screened by the ERP.

Hypotheses of Detriment:
1. Greater proximity of a proposed new diversion points to spawning grounds, migrations corridors or nursery habitats of nearly every species of concern would increase the exposure of these populations to screening stress and other diversion effects.
2. A central delta diversion point does not address existing central and western Delta hydrodynamic impacts and associated indirect mortality concerns.
3. Lack of fish data (presence, absence, densities) from salvage operations could increase difficulty of managing projects in real-time to reduce impacts or require extensive, expensive and for some species potentially high-impact sampling to obtain needed information.

SPECIES-SPECIFIC CONCERNS
The applicability of each hypothesis was evaluated for each of the species of concern identified in the earlier DEFT reports. These species and life-stages were identified as potential gaps in the protection from entrainment afforded by the 1995 Water Quality Control Plan. They are:
Delta smelt adults – Jan through March
Steelhead – February through May
Delta smelt young – March through June
Fall-run smolts from the San Joaquin – March through June
Striped bass – May through July of wet years when striped bass spawn in the lower San Joaquin
June through August of dry years when spawning is restricted to the Sacramento
Splittail – May through July of wet years following dry years.
Spring-run Yearlings – November through January
Chinook salmon fry – December through February of wet years

The results of a preliminary assessment of the degree to which each hypothesis is applicable to each species of concern is presented in table I. Overall, species for which many beneficial hypotheses may apply are also species for which many of the detrimental hypotheses are likely to apply. The net effect of these competing effects on each species would need to be addressed by detailed analyses, research and monitoring.

GENERAL CONCERNS
Additional issues that were raised but not evaluated included:
1. The value of aquatic habitats in Trapper and Whiskey sloughs and Victoria Canal that are proposed to be isolated and used for conveyance in option A.
2. The effects of isolating Trapper and Whiskey slough and Victoria Canal on hydrodynamics of the southern and central delta.
3. The interaction of Option A with habitat restoration efforts in the south delta.
4. The relationship of these options with the use of an Environmental Water Account.
5. The relationship of Option A with barrier and dredging operations in the south delta.

Species	Delta smelt		Salmonids				Striped bass		Splittail
life stage	adults	young	fry	SJ	Spring	steel-head	wet	dry	young
Beneficial Hypotheses									
1	++	++	+	+	+	+	0	+	+
2	+	+	+	+	0	+	0	+	+
3	+	+	0	+	+	+	+	+	++
4	++	++	0	0	0	0	0	+	+
5	++	++	0	++	+	+	++	++	+
6	0	+ to ++	0	0 to +	0	0	+	0	+
7	0 to +	0 to +	0	0	0	0	0 to +	0	+
Detrimental Hypotheses									
1	++	++	+	++	++	++	++	+	+
2	+	++	0 to +	+	+	+	++	++	0 to+
3	++	+	0	+	0	0	0	0	+

Table 1. Summary of applicability of each hypothesis to life stage of concern. 0 indicates that hypothesis does not relate to life stage. + indicates that hypothetical effect may be relevant to indicated life stage. ++ indicates that hypothetical effect could be very relevant to indicated life stage. Most effects would be determined by operational patterns and the relative sizes of diversions, channels and storage volumes.